Georgia Basin-Puget Sound

International Airshed Strategy

June 2005

1. Statement of Purpose

The purpose of the Georgia Basin-Puget Sound (GB-PS) International Airshed Strategy is, through international and regional co-operation and collaboration, to:

- Reduce the impacts of air pollution to human health, ecosystems, and visibility in the GB-PS airshed;
- Prevent future deterioration and work towards continuous improvement of air quality in the GB-PS region; and,
- Establish practical and effective instruments to address shared concerns regarding transboundary air pollution in the GB-PS region.

2. Operating Principles

The GB-PS International Airshed Strategy was developed by a coordinating committee, under the US-Canada Border Air Quality Strategy, a cooperative effort to investigate barriers to reducing air pollution in transboundary air basins in North America developed under the auspices of the 1991 US-Canada Air Quality Agreement. The Coordinating Committee is made up of members from regional, provincial, state and federal government agencies, and First Nations and Tribes. Environment Canada Pacific and Yukon Region (PYR) and the Environmental Protection Agency (EPA) Region 10 act as co-lead agencies, coordinating joint activities by the Committee.

Committee members can nominate new members, who are accepted by consensus. Meetings of the Committee are open to other agencies, the general public, and other interested parties who can attend as observers or associate member agencies.

The Committee meets approximately every six months, alternately in Canada and the USA. Canadian meetings are hosted by Environment Canada PYR and US meetings are hosted by EPA Region 10. The work of the Committee is supported by staff resources, shared funding and in-kind contributions from member agencies.

The Committee recognizes that both inter-agency collaboration and unilateral initiatives are necessary to improve air quality in the region. In this regard, agencies may develop or use existing collaborative mechanisms, including:

- International frameworks between regional representatives of the federal governments (e.g. EC/EPA Joint Statement of Cooperation of the Georgia Basin and Puget Sound Ecosystem);
- Formal international agreements (e.g. the Canada-US. Air Quality Agreement);
- State-province agreements (e.g. B.C.-Washington Environmental Cooperation Agreement);
- Cooperative arrangements between regional agencies (e.g. cooperative air quality monitoring agreement between GVRD and FVRD);
- Others, such as the Georgia Basin Action Plan.

The GB-PS IAS Coordinating Committee will continue to meet biannually to review progress on commitments made through the initiatives of the International Airshed Strategy. These biannual meetings will also provide a forum to report progress on the IAS supporting initiatives, as described below.

Ongoing collaboration is required to ensure that air quality deterioration is prevented and continuous improvement is made despite the significant population growth that this region is predicted to experience for at least the next two decades. It is expected that as progress is made some initiatives may no longer need to be coordinated through the IAS process. In addition, new scientific information may identify other issues relevant in a transboundary airshed context that can best be addressed through the IAS approach and warrant addition as new initiatives. These may be identified through the Issues Ranking Identification (IRIS) process, developed as an "early action" of the IAS process and defined in the appendices.

3. Context

The GB-PS airshed is located in the western coastal region of the Canada-USA border. Seattle and Vancouver are the largest communities, and the provincial capital of British Columbia (Victoria) and the state capital of Washington (Olympia) are also located here.

Some significant sources of air emissions in the GB-PS include: marine vessels; automobiles, trucks and buses (particularly vehicles with diesel engines); agricultural operations; wood stoves and other space heating; open burning of yard and wood waste; industrial combustion sources; and thermal power plants.

Air quality in this region currently meets relevant national air quality standards on each side of the border. However, there are still important air quality concerns in this international airshed since research shows that visibility and ecosystem health are diminished and human health is affected at existing levels of air pollution.

The effects of air pollutants on human health can range from eye and throat irritation to difficulty breathing, wheezing, coughing and aggravation of existing respiratory and cardiac conditions. These effects can result in increased medication use, increased doctor or emergency room visits, more hospital admissions and even premature death. Ecosystem effects include reduced visibility, atmospheric deposition to land and water ecosystems, and ozone damage of plant tissue, and others.

Projected significant growth in population, economic activity, motor vehicle use, and other transportation sources in Vancouver, Seattle and surrounding areas will increase air pollution if this growth is not well managed. Recent projections show that the regional population will grow from about six million in 2000 to nine million by 2020, a 50% increase in twenty years.

A major challenge faced by governments on both sides of the border is improving air quality even as the population grows. In addition, the region is home to world-renowned parks, reserves and vistas that contribute to strong tourism and a high quality of life for residents. Both the US and Canadian governments have programs designed to protect air quality in areas that meet the national standards and to improve visibility. These are: the Prevention of Significant Deterioration (PSD) program and Regional Haze Rule in the US, and in Canada, the "Keeping Clean Areas Clean" and "Continuous Improvement" components of the Canada-Wide Standards and the ongoing Canadian Council of Ministers for the Environment process.

Despite the challenge of managing air quality in a multi-jurisdictional, transboundary airshed, there is a long history of cooperation between the United States and Canada on environmental matters. Early successes included the 1941 Trail Smelter Arbitration. Significant progress in the 1970s and 80s led to the development of the Canada-US Air Quality Agreement (AQA) in 1991. Other efforts have taken shape under the AQA including the 2000 Ozone Annex and the 2003 Border Air Quality Strategy. Accomplishments at the state, provincial and regional levels have included the 1992 Environmental Cooperation Agreement between British Columbia (BC) and the State of Washington (WA); the 1994 Interagency Agreement among BC, WA, the Greater Vancouver Regional District, and the Northwest Air Pollution Authority; the 2000 Joint Statement of Cooperation on the Georgia Basin and Puget Sound Ecosystem; and the 2002 Statement of Intent on a Georgia Basin and Puget Sound International Airshed Strategy.

For all of the agencies involved in the IAS, continued collaboration across jurisdictions is an important objective. In addition, the primary function of each agency is to manage air quality within its jurisdiction and according to its standards and objectives. Both missions require that current, high-quality scientific information be available to regulatory agencies to inform decision-making. A key science component of the GB-PS International Airshed Strategy is the characterization of the GB-PS Airshed. The initial characterization identified transboundary flow in the GB-PS area, with key findings based on meteorological patterns, ambient air quality data and the most recent inventories of air pollutant emissions. These were combined with emission forecasts and application of robust air quality computer models to describe future air pollutant concentrations. The report, "Characterization of the Georgia Basin/Puget Sound Airshed", and associated implications must be re-visited as new scientific information and results from modelled emission scenarios become available. The results of studies through the Border Air Quality Strategy, the Georgia Basin Action Plan and other initiatives will continue to provide

continuing scientific support for the development and implementation of the International Airshed Strategy.

Other examples of important scientific work to develop knowledge about air quality and its relation to human health and ecosystems in the GB-PS airshed include:

- the Lower Fraser Valley emission inventory for the year 2000, including an emissions forecast and backcast by the GVRD;
- the NWAPA Bellingham air toxics screening project (2000);
- the EC PYR economic analysis of lost tourism revenue from degraded regional air quality (2000);
- the multi-agency Pacific 2001 air quality field study;
- the BC Lung Association report on air quality and health (2003);
- the EPA Region 10 Northwest Air Summit consultation (2003);
- the BC WLAP/EC study on particulate matter in British Columbia (2003);
- the 2003 Puget Sound toxics evaluation by the PSCAA;
- the FVRD analysis of best management practices to reduce ammonia emissions from the Lower Fraser Valley agricultural sector (2004);
- the 2004 Western Airborne Contaminants Assessment project by the US National Park Service (including Olympic National Park); and
- the ongoing air quality monitoring by various government agencies, the Swinomish Tribe, Tsawwassen First Nation and Snuneymux (Nanaimo) First Nation; and,
- The ongoing air toxics monitoring program in Seattle by WA DoE.

Based on the co-operative scientific and policy analysis described above, the GB-PS International Airshed Strategy Coordinating Committee sought to inform its deliberations regarding possible transboundary airshed management mechanisms. This resulted in a report that identified the strengths and weaknesses of various mechanisms (Melious, 2004) and assisted the Coordinating Committee in its development of the GB-PS International Airshed Strategy.

4. Goals

As sister nations, Canada and the US share many goals, including preserving and enhancing the welfare of natural systems and protecting the health of their citizens. The national governments of both countries have recognized that in many areas their airsheds have become degraded by the same pollutants – ozone and particulate matter, their precursors, and acid deposition. These contaminants know no boundaries and they exacerbate the difficulties and concerns of citizens on both sides of the border. Over the past decade, each country has established its own means of maintaining and enhancing these areas, with distinct mandates, goals and objectives within the context of its environmental programs.

Members of the GB-PS Coordinating Committee have identified these goals for improving air quality in the region through ongoing transboundary co-operation and collaboration.

1. Reduce the risk of adverse effects on human health and ecosystems.
2. Increase visibility and reduce regional haze in the airshed.

The GB-PS Coordinating Committee recognizes that some actions taken to achieve these goals may also reduce emissions of greenhouse gases in the region, an objective shared by many of the coordinating committee partners.

These goals and objectives are to be addressed within the context of each country's legal mandates, regulatory systems, and voluntary programs. This international airshed strategy recognizes, in particular, the potential of the Canadian programs for Continuous Improvement and Keeping Clean Areas Clean, and the US programs for Prevention of Significant Deterioration and reducing regional haze to help met these goals.

These goals will be supported by a series of initiatives that will stress emissions reductions and improved air quality management. Initiatives will be chosen based on scientific information and where a greater response will be produced by collaborative efforts.

The Coordinating Committee will develop and revise the list of initiatives. In the future, the Coordinating Committee may decide to remove initiatives once they have achieved their objectives and further transboundary collaborative efforts are no longer required. The Committee may also add new initiatives where new information warrants action and such a cooperative transboundary approach is the preferred method to accomplish air quality improvements. The Issue Ranking and Identification System (see appendix F.) may be used to identify such new initiatives.

Appendix A – Georgia Basin-Puget Sound transboundary area

Appendix B – Acronyms

BC	British Columbia
BC WLAP	British Columbia Ministry of Water, Land and Air Protection
CAA	Clean Air Act
CCME	Canadian Council of Ministers for the Environment
CI	Continuous Improvement
CWS	Canada-Wide Standards
EC	Environment Canada
ECE	Economic Commission for Europe
EPA	Environmental Protection Agency
FVRD	Fraser Valley Regional District
GB	Georgia Basin
GVRD	Greater Vancouver Regional District
IAS	International Airshed Strategy
IRIS	Issues Ranking and Identification System
KCAC	Keeping Clean Areas Clean
LFV	Lower Fraser Valley
NOx	Nitrogen Dioxides
NSR	New Source Review
NWCAA	Northwest Clean Air Agency
ORCAA	Olympic Region Clean Air Agency
PM	Particulate Matter
PM10	Particulate Matter less than 10 microns in size
PM2.5	Particulate Matter less than 2.5 microns in size
Ppb	Parts per billion
Ppm	Parts per million
PS	Puget Sound
PSCAA	Puget Sound Clean Air Agency
PSD	Prevention of Significant Deterioration
RHR	Regional Haze Rule
SO2	Sulphur dioxide
SOx	Sulphur oxides
ug/m3	micrograms per cubic metre
VOC	Volatile organic compounds
WA	Washington State
WA DoE	Washington State Department of Ecology

Appendix C - Air Quality Standards & Objectives

Since there are several agencies in the GB-PS area that have regulatory authority over air quality management, there are different standards and authorities for managing air contaminants. These include the:

- BC Air Quality Objectives;
- GVRD Air Quality Objectives;
- National Canada-Wide Standards (to be achieved by 2010);
- National Ambient Air Quality Standards for the US;
- Northwest Air Pollution Authority's Ambient Air Standards;
- Puget Sound Clean Air Agency's Ambient Air Quality Standards;
- US Tribal Authority (Air) Rule*;
- Washington State Ambient Air Quality Standards;

Other agencies in the area that have air quality planning and or regulatory authority include:

- Fraser Valley Regional District; and,
- US Tribes (as per the Tribal Authority (Air) Rule).

* The US EPA Tribal Authority (Air) Rule states that the Clean Air Act (CAA) directs EPA to promulgate regulations specifying those provisions of the Act for which it is appropriate to treat Indian tribes in the same manner as states. For those provisions specified, a tribe may develop and implement one or more of its own air quality programs under the Act. This final rule sets forth the CAA provisions for which it is appropriate to treat Indian tribes in the same manner as states, establishes the requirements that Indian tribes must meet if they choose to seek such treatment, and provides for awards of federal financial assistance to tribes to address air quality problems. Note that in Canada, some First Nations have delegated authority from the federal Department of Indian Affairs and Northern Development (Indian Act Section 35) to manage land and environmental issues on reserve, including activities that relate to air quality.

Table 2 (below) summarizes the various air quality standards and objectives relevant to the GB-PS transboundary region.

Table 2: Air Quality Standards and Objectives in the GB-PS airshed

Agency	Ozone (ppb)	PM_{10} (ug/m^3)	$PM_{2.5}$ (ug/m^3)	SO_2 (ppm)	NO_2 (ppm)
Canadian					
• CCME CWS	65 [8h, 3ya4]	n/a	30 [24h, 3ya98]	n/a	n/a
• NAAQO**	82[1h] 25[24h] 15[a]	n/a	n/a	0.35[1h] 0.10[24h] 0.02[a]	0.21[1h] 0.11[24h] 0.05[a]
• BC MoE [LVLb]	As per CWS and NAAQO	50 [24h]	As per CWS	As per NAAQO	As per NAAQO
• GVRD*	As per CWS and NAAQO	50 [24h]/ 30 [g] (Annual objective)	As per CWS	As per NAAQO (Maximum acceptable level)	As per NAAQO (Maximum acceptable level)
U.S.					
• U.S. EPA NAAQS	80 [8h]	150 [24h]/ 50 [a]	65 [24h]/ 15 [a, 3ya]	0.03 [a]/ 0.14 [24h]	0.053 [a]
• WA DoE	As per EPA Standards	As per EPA Standards	As per EPA Standards	As per EPA Standards	As per EPA Standards
• NWCAA	As per EPA Standards	As per EPA Standards	As per EPA Standards	0.020 [a]/ 0.100 [24h] 0.800[5m]	0.050 [a]
• PSCAA	As per EPA Standards	As per EPA Standards	As per EPA Standards 25 [24h, Goal]	As per EPA Standards	As per EPA Standards

* - please note that GVRD objectives are currently under review as part of a new Air Quality Management Plan.
** - link to National Ambient Air Quality Objectives (NAAQO) http://www.hc-sc.gc.ca/hecs-sesc/air_quality/regulations.htm#3
a - based on the annual arithmetic mean
LVLb –The level "B" of the BC Ambient Air Quality Objectives is reported here. The BC MoE PM_{10} objective is meant to be equivalent to Level B.
g = based on the geometric mean
x – never to be exceeded
1h - 1 hour average
8h - 8 hour average
24h - 24 hour average (not to be exceeded more than once per year) Note: BC MoE objectives are treated as not to be exceeded numbers
5m – 5 minute average
3ya - to attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15 ug/m3.
3ya98 – achievement to be based on the 98th percentile ambient measurement annually, averaged over three consecutive years
3ya4 – achievement to be based on 4th highest measurement annually, averaged over three consecutive years
Goal – goal approved by the board of directors

Appendix D – Definitions

1. “Air pollutant (or contaminant)", for the purposes of this Strategy, means a substance that is emitted into the air and that: injures or is capable of injuring the health or safety of a person, injures or is capable of injuring property or any life form, interferes or is capable of interfering with visibility, interferes or is capable of interfering with the normal conduct of business, causes or is capable of causing material physical discomfort to a person, or damages or is capable of damaging the environment;

2. “Air pollution” means the presence in the environment of substances or contaminants that substantially alter or impair the usefulness of the environment;

3. “Environmental justice” means the fair treatment and meaningful involvement of all people. Therefore, no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local and tribal programs and policies;

4. “Georgia Basin” means the geographic area of southwestern British Columbia, adjacent to the International border with the United States, and defined by the watershed of the Straight of Georgia;

5. “Georgia Basin-Puget Sound” or “Georgia Basin-Puget Sound International Airshed” means the combined transboundary area of the Georgia Basin and Puget Sound (Appendix A);

6. “Characterization of the Georgia Basin-Puget Sound Airshed” means the scientific study of meteorological patterns, ambient air quality data and the most recent inventories of air pollutant emissions with emission forecasts and the application of state-of-the-science air quality computer models describing future air pollutant concentrations;

7. “Georgia Basin-Puget Sound International Airshed Strategy Coordinating Committee” means the members of the GB-PS International Airshed Strategy. Members are defined in Appendix E, below;

8. “Lower Fraser Valley”, for the purposes of this Strategy, means the geographic area defined by the Greater Vancouver Regional District and Fraser Valley Regional District in Canada and Whatcom County in the US; and including the Strait of Juan de Fuca;

9. “Puget Sound” means the geographic area of northwestern Washington State, adjacent to the Georgia Basin airshed, and defined by the watershed boundaries of Puget Sound;

10. “Smog Forming Pollutants”, for the purposes of this Strategy, are those air contaminants which are routinely inventoried by regulatory agencies and are associated with visibility impairment and the formation of ground level ozone and fine particulate matter in the airshed, namely PM2.5, NOx, VOC, SOx, and NH3.

11. "Transboundary air pollution" means air pollution whose physical origin is situated wholly or in part within the area under the jurisdiction of one Party and which has adverse effects, other than effects of a global nature, in the area under the jurisdiction of the other Party;

Appendix E – Membership of the GB-PS International Airshed Strategy Coordinating Committee

Member agencies:

Canada

British Columbia Ministry of Water, Land and Air Protection
Coast Salish Sea Initiative
Environment Canada (Pacific-Yukon Region)
Fraser Valley Regional District
Greater Vancouver Regional District
Health Canada
Stó:lô Tribal Council
Tsawwassen First Nation

USA

Northwest Clean Air Agency
Puget Sound Clean Air Agency
Olympic Region Clean Air Agency
Swinomish Indian Tribal Community
Upper Skagit tribe
US EPA (Region 10)
US National Park Service
Washington State Department of Ecology

Associate Member Agencies

Fraser Basin Council

Note - the GB-PS IAS Coordinating Committee has made efforts to invite participation by First Nations and Tribes throughout the GB-PS area.

Appendix F - Issue Ranking and Identification System (IRIS)

DECISION TREE FOR AIR QUALITY ISSUES	**Prepared by:** **Date:**

INSTRUCTIONS:

- Answer all questions to the best of your ability with readily-available information. The purpose of the Issue Ranking and Identification System (IRIS) is to assess, in a timely manner, whether an issue requires an International coordinated response or not. It is not meant to require major research to apply.
- Questions on "highlighted" lines are meant to elicit commentary – they are not part of the Yes/No decision-making tool.
- In order to qualify as an issue requiring an International coordinated response, the answer to all 4 questions must be "Yes".
- In the "Next Steps" section, outline what you think some logical next steps might be.
- Address any climate change co-benefits in the "comments" section

Name and Brief Description of the Issue		
Question	**Answer**	**Comments**
1. Is this issue causing a negative impact on air quality? **2. Can we quantify or assess the importance of this impact?** **3. Does the issue or the impact have a cross-border dimension such that responses should be coordinated between Canadian and U.S. agencies and authorities?** • **If so, what would be the objectives of such a coordinated response?** **4. Are there promising approaches for reducing the impact?** • **If so, what are they?**		
Next Steps		